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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,282	09/16/2003	Yasuyuki Matsuya	5259-000031	3218

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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/663,282	MATSUYA, YASUYUKI	
	Examiner	Art Unit	
	WALTER F. BRINEY III	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *6 and 7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 27 February 2008 has been entered.

Restriction

Claims 6 and 7 remain withdrawn as directed to a non-elected invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-2, 4-5, 8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,636,264 (patented 3 June 1997) (herein *Sulavuori*) in view of Wiki 1, Wiki 2 and US Patent 4,829,299 (patented 9 May 1989) (herein *Mandell*).**

Claim 1 is limited to a data communication method. This rejection analyzes the converting step and the driving step. All other claimed steps are rejected for the same reasons presented in the Final Rejection at p. 2 (28 November 2007). The converting

step requires, on a transmitting side, converting analog signals comprising voice or music or digital signals obtained by digitizing voice or music into non-return-to-zero digital signals formed by 1-bit data streams using a *noise shaping* method. *Sulavuori* discloses this step since *Sulavuori* discloses using a continuously variable slope delta ("CVSD") modulator to encode voice signals into a 1-bit data stream. *Id.* CVSD uses a leaky integrator in the feedback path. *See Wiki 2* ("Each input sample is compared to the reference sample. If the input sample is larger, the encoder...adds the step size to the reference sample. If the input sample is smaller, the encoder...subtracts the step size from the reference sample."). The use of a leaky integrator in a delta modulator's feedback path is known in the art to produce modulations resembling sigma-delta modulation. *Mandell* at col. 1 ll. 45-55. Since sigma-delta modulation performs noise-shaping as claimed and a CVSD modulator behaves as a sigma-delta modulator, a CVSD modulator also performs noise-shaping just as claimed. *Wiki 1* at § Noise shaping and 1 bit converters.

The driving step includes, on the receiving side, (1) *directly* driving a musical sound output section by electrical signals (2) obtained from the received signals (3) so as to convert the electrical signals into musical sound signals. Earphone 201 of *Sulavuori* is a speaker, so it converts electrical signals into sound just like the claimed musical sound output section. *Sulavuori* at col. 8 ll. 3-8. The only electrical signals directly driving earphone 201 are the signals output from lowpass filter 217. *Id.* at fig.4B. The output from lowpass filter 217 is derived from signals received at IR receiver 206, so the output of lowpass filter 217 does correspond to the claimed electrical signals. *Id.* Accordingly,

lowpass filter 217 converts signals received from receiver 206 into electrical signals that directly drive earphone 201 just as the claimed method directly drives a music sound output section by electrical signals obtained from received signals. Therefore, *Sulavuori* in view of *Wiki 1*, in view of *Wiki 2* and further in view of *Mandell* anticipates all limitations of the claim.

Claim 2 is limited to a data transmitting apparatus. This rejection analyzes the 1-bit conversion section. All other claimed sections are rejected for the same reasons presented in the Final Rejection at pp. 2-3 (28 November 2007). The 1-bit conversion section converts analog signals comprising voice or music or digital signals obtained by digitizing voce or music into non-return-to-zero digital signals formed by 1-bit data streams using a noise shaping method. *Sulavuori* discloses this section because *Sulavuori* discloses using speech coding section 104 and pulse shaper 105 to generate 1-bit non-return-to-zero digital signals. *Id.* The speech coding section 104 uses CVSD. CVSD includes a leaky integrator that causes the delta modulation to behave as a sigma-delta modulation at certain frequencies. Rejection of claim 1 *supra*. Since sigma-delta modulation is a noise shaping method and CVSD acts a sigma-delta modulator, *Sulavuori* sections 104 and 105 generate 1-bit non-return-to-zero digital signals using a noise shaping method. *Id.* Therefore, *Sulavuori* in view of *Wiki 1*, in view of *Wiki 2* and further in view of *Mandell* anticipates all limitations of the claim.

Claim 8 is limited to a data transmitting apparatus. This rejection analyzes the drive section. All other claimed sections are rejected for the same reasons presented in the Final Rejection at p. 3 (28 November 2007). The drive section generates return-to-

zero drive signals as the electrical signals to directly drive the musical sound output section based on the return-to-zero digital signals received by the radio receiving section. A broad construction of the term musical sound output section allows for the inclusion of *Sulavuori* speech decoder 216, lowpass filter 217 and earphone 201. Indeed each of 216, 217 and 201 are necessary for converting electrical signals into music sound signals. Pulse stretching circuit 215 both stretches return-to-zero pulses and directly drives speech decoder 216 with signal 42. *Sulavuori* at col. 7 ll. 58-60, figs.1, 2 & 4B. Since pulse stretching circuit 215 stretches return-to-zero signals, directly drives decoder 216 and decoder 216 is part of a circuit corresponding to the claimed music sound output section, the pulse stretching circuit 215 corresponds to the claimed drive section. Therefore, *Sulavuori* in view of *Wiki 1*, in view of *Wiki 2* and further in view of *Mandell* anticipates all limitations of the claim.

Claims 4-5 and 10 are rejected for the same reasons apropos claims 2 and 8 *supra* as well as the respective reasons presented in the Final Rejection at p. 3 (28 November 2007).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 4-5, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sulavuori* in view of US Patent 5,276,764 (patented 4 January 1994) (herein *Dent*).

Notwithstanding the rejection of these claims under 35 USC § 102(b), applicant's contention that CVSD does not perform noise shaping is obviated by the obviousness of replacing a CVSD modulator with a sigma-delta modulator that applicant admits performs noise shaping. Applicant Arguments at pp. 8-9 (27 February 2008).

Claim 1 is limited to a data communication method. This rejection analyzes the converting step and the driving step. All other claimed steps are rejected for the same reasons presented in the Final Rejection at p. 2 (28 November 2007). The converting step requires, on a transmitting side, converting analog signals comprising voice or music or digital signals obtained by digitizing voice or music into non-return-to-zero digital signals formed by 1-bit data streams using a *noise shaping* method. *Sulavuori* discloses using a continuously variable slope delta ("CVSD") modulator to encode voice signals into a 1-bit data stream. *Id.* Assuming *arguendo* applicant is correct that CVSD does not perform noise shaping, using sigma-delta modulators for voice conversion instead of CVSD modulators was well known. For example, *Dent* teaches the use of both CVSD and sigma-delta modulators as equivalents and alternatives for the compression/expansion of analog signals into digital signals when the analog signal is voice for transmission. *See Dent* at col. 1 ll. 7-14, 38-42, col. 5 ll. 9-24, 39-50, col. 6 ll. 17-20. Therefore, one of ordinary skill in the art at the time of applicant's invention would have found replacing the CVSD modulator of the *Sulavuori* voice coder with a

sigma-delta modulator according to *Dent* obvious since sigma-delta modulators are art recognized equivalents for coding voice signals.

The driving step includes, on the receiving side, (1) *directly* driving a musical sound output section by electrical signals (2) obtained from the received signals (3) so as to convert the electrical signals into musical sound signals. Earphone 201 of *Sulavuori* is a speaker, so it converts electrical signals into sound just like the claimed musical sound output section. *Sulavuori* at col. 8 ll. 3-8. The only electrical signals directly driving earphone 201 are the signals output from lowpass filter 217. *Id.* at fig.4B. The output from lowpass filter 217 is derived from signals received at IR receiver 206, so the output of lowpass filter 217 does correspond to the claimed electrical signals. *Id.* Accordingly, lowpass filter 217 converts signals received from receiver 206 into electrical signals that directly drive earphone 201 just as the claimed method directly drives a music sound output section by electrical signals obtained from received signals. Therefore, *Sulavuori* in view of *Dent* makes obvious all limitations of the claim.

Claim 2 is limited to a data transmitting apparatus. This rejection analyzes the 1-bit conversion section. All other claimed sections are rejected for the same reasons presented in the Final Rejection at pp. 2-3 (28 November 2007). The 1-bit conversion section converts analog signals comprising voice or music or digital signals obtained by digitizing voce or music into non-return-to-zero digital signals formed by 1-bit data streams using a noise shaping method. The 1-bit conversion section is obvious in view of the combination of *Sulavuori* and *Dent* for the same reasons the converting step of

claim 1 is obvious. Therefore, *Sulavuori* in view of *Dent* makes obvious all limitations of the claim.

Claim 8 is limited to a data transmitting apparatus. This rejection analyzes the drive section. All other claimed sections are rejected for the same reasons presented in the Final Rejection at p. 3 (28 November 2007). The drive section generates return-to-zero drive signals as the electrical signals to directly drive the musical sound output section based on the return-to-zero digital signals received by the radio receiving section. A broad construction of the term musical sound output section allows for the inclusion of *Sulavuori* speech decoder 216, lowpass filter 217 and earphone 201. Indeed each of 216, 217 and 201 are necessary for converting electrical signals into music sound signals. Pulse stretching circuit 215 both stretches return-to-zero pulses and directly drives speech decoder 216 with signal 42. *Sulavuori* at col. 7 ll. 58-60, figs.1, 2 & 4B. Since pulse stretching circuit 215 stretches return-to-zero signals, directly drives decoder 216 and decoder 216 is part of a circuit corresponding to the claimed music sound output section, the pulse stretching circuit 215 corresponds to the claimed drive section. Therefore, *Sulavuori* in view of *Dent makes obvious* all limitations of the claim.

Claims 4-5 and 10 are rejected for the same reasons apropos claims 2 and 8 *supra* as well as the respective reasons presented in the Final Rejection at p. 3 (28 November 2007).

3. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sulavuori* in view of admitted prior art. These claims are simultaneously rejected under 35 U.S.C. 103(a) in further view of *Dent*.

The following rejection(s) are based on the 35 U.S.C. 102(b) rejection of claim 2, but equally apply *mutatis mutandis* to the 35 U.S.C. 103(a) rejection of claim 2.

Regarding **Claim 3**, as shown above apropos of Claim 2, Sulavuori anticipates all elements except use of the physical layers of Fast IrDA physical layer digital infrared communication standard. As applicant admits in the claim, the physical layers of Fast IrDA is a physical layer digital infrared communication standard. Sulavuori discloses a digital infrared communication interface. One skilled in the art would have known that use of a standard interface facilitates design and availability of components and insures operability. It would have been obvious to one skilled in the art at the time of the invention to apply the standard physical layers of Fast IrDA to the transmitter taught by Sulavuori for the purpose of realizing the aforesaid advantages.

Regarding **Claim 9**, as shown above apropos of Claim 8, Sulavuori anticipates all elements except use of the physical layers of Fast IrDA physical layer digital infrared communication standard. As applicant admits in the claim, the physical layers of Fast IrDA is a physical layer digital infrared communication standard. Sulavuori discloses a digital infrared communication interface. One skilled in the art would have known that use of a standard interface facilitates design and availability of components and insures operability. It would have been obvious to one skilled in the art at the time of the

invention to apply the standard physical layers of Fast IrDA to the transmitter taught by Sulavuori for the purpose of realizing the aforesaid advantages.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Sulavuori* in view of any one of *Law* (US Patent 6,064,699), *Smith III et al.* (US Patent 4,627,090) or *Dean et al.* (US Patent 5,008,964). This claim is simultaneously rejected under 35 U.S.C. 103(a) in further view of *Dent*.

The following rejection(s) are based on the 35 U.S.C. 102(b) rejection of claim 2, but equally apply *mutatis mutandis* to the 35 U.S.C. 103(a) rejection of claim 2.

Regarding **Claim 11**, Sulavuori further discloses a low-pass filter 217 that filters the decoded speech signals before reproduction by earphone 201. Therefore, Sulavuori anticipates all elements except a high pass filter that removes a DC component. Law discloses a CVSD demodulator (Fig. 12C) with a capacitor C11 that corresponds to the high pass filter claimed and removes a DC component in the input to amplifier 270 (column 7, lines 57-62). Smith discloses a CVSD demodulator (Fig. 2) with capacitors (output of amplifier in 500 and input of loudspeaker 560) that correspond to the high pass filter claimed and remove a DC component in the input to amplifier 104 and loudspeaker 44. Dean discloses a CVSD demodulator (Fig. 3C) with capacitors (Fig. 7, output of 100 and between 104 and 44) that correspond to the high pass filter claimed and remove a DC component in the input to amplifier 104 and loudspeaker 44. One skilled in the art would have known that such an arrangement optimizes the dynamic range of the amplifier and loudspeaker. As such, it would have been obvious to one skilled in the art at the time of the invention to apply the high-pass filtering capacitor taught by any one of Law, Smith

or Dean to the receiver taught by Sulavuori for the purpose of realizing the aforesaid advantage.

5. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sulavuori* in view of any one of *Law, Smith or Dean* and further in view of *Hamasaki et al.* (US Patent 5,815,051) and *Quintus et al.* (US Patent 4,833,418). These claims are simultaneously rejected under 35 U.S.C. 103(a) in further view of *Dent*.

The following rejection(s) are based on the 35 U.S.C. 102(b) rejection of claim 2, but equally apply *mutatis mutandis* to the 35 U.S.C. 103(a) rejection of claim 2.

Regarding **Claims 12 and 13**, as shown above apropos of Claim 11, the combination of Sulavuori and any one of Law, Smith or Dean makes obvious all elements except the structure of the filters claimed. A low-pass filter disclosed in Quintus (Fig. 3, reference 150; column 5, lines 43-54) and a high-pass filter disclosed in Hamasaki (Fig. 16; column 8, lines 47-60) that combine to form the filter section claimed. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the filter structures of Quintus and Hamasaki in the combination made obvious by Sulavuori and any one of Law, Smith or Dean. Applicant has not disclosed that the particular filter structures claimed provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with the filter structures taught by Quintus and Hamasaki in any relative disposition because the changing the relative position of cascaded passive filters does not affect the resultant

characteristic. Therefore, it would have been obvious to one of ordinary skill in the art to modify the combination made obvious by Sulavuori and any one of Law, Smith or Dean to obtain the invention as specified in Claims 12 and 13.

Response to Arguments

Applicant's arguments filed 27 February 2008 have been fully considered but they are not persuasive. Applicant alleges that CVSD does not perform noise shaping like a sigma-delta modulator because delta modulators produce a signal $v(n) = [\, u(n) - u(n-1)\,] + [\, e(n) - e(n-1)\,]$, such that demodulation of v(n) produces a signal $y(n) = u(n) - e(n)$ (i.e. the error signal e(n) is unchanged by the modulation). Applicant Arguments at p. 9 (27 February 2008). Applicant's proffered signal v(n) is an inaccurate estimation of a CVSD modulator, however, since the signal does not reflect the true frequency response of the CVSD modulator's feedback path. Instead of modeling the frequency-dependent response of the CVSD modulator's feedback path, applicant's signal just assumes the feedback path is a time-shift. On the contrary, a CVSD feedback path includes a leaky integrator that causes the CVSD modulator to behave as a sigma-delta modulator. *Mandell* at col. 1 ll. 45-55. Sincev applicant's argument fails to account for the frequency-dependent nature of CVSD modulators, applicant's argument is unpersuasive.

The applicant also refers to the inventor's declaration. The inventor's declaration makes several allegations of difference between the CVSD modulator disclosed by *Sulavuori* and the noise-shaping modulator invented. Rule 131 Declaration at ¶¶ 20-32 (27 February 2008). The inventor's mode of argument finds each difference arising because delta modulators require features that sigma-delta modulators do not. The

inventor's premise for patentability must be that all noise-shaping modulators are like sigma-delta modulators, so the use of the term noise-shaping in the claims is enough to structurally distinguish the prior art CVSD modulator from the claimed invention. However, applicant's premise is fallacious since CVSD modulators perform noise shaping according to the teachings of *Mandell* at col. 1 ll. 45-55. Thus, the mere nomination of noise shaping is insufficient to distinguish the claimed invention from the prior art.

Conclusion

References cited but not relied upon:

- US Patent 6,160,894 (digital speaker driven by RZ signals) and
- US Patent 5,592,559 (digital speaker driven by RZ signals).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WALTER F. BRINEY III whose telephone number is (571)272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Walter F Briney III/
Examiner
Art Unit 2615

3/27/08